an iron railing substituted, was afterwards executed by the very man he had employed to take down the rood. On which class of his readers our author expects these to have effect we cannot pretend to say. In the last of them he thus sketches the modern ambonoclast, a character which, he states, was not "seen about in this country previous to the consecration of St. George's Church:"—

"It has been asserted that their first dislike of screens arose from a desire of literary notoriety, and that, finding several old women of both sexes had taken a most unaccountable and inexplicable offence at the ancient division of the chancel, and the restoration of the crucifix, which had been so wisely destroyed in the good old days of Queen Bess, they profited by the occasion to increase the sale of a periodical. But this may be mere calumny; and, indeed, it is very probable that it is a case of pure development, as at first they did not exhibit any repugnance to pointed churches, which they rather lauded, and only took objection to certain upright mullions and painful images: but they speedily developed other propensities and ideas, and latterly have exhibited symptoms almost similar to hydrophobia at the sight, or even mention, of pointed arches or pillars. The principal characteristics of modern ambonoclasts may be summed up as follows:—Great irritability at vertical lines, muntans of screens, or transverse beams and crosses; a perpetual habit of abusing the finest works of Catholic antiquity and art, and exulting in the admiration of everything debased, and modern, and trumpery; an inordinate propensity for candles and candlesticks, which they arrange in every possible variety; they require great excitement in the way of lively, jocular, and amatory tunes at divine service, and exhibit painful distress at the sound of solemn chanting or plain song: at divine worship they require to sit facing the altar, and near the pulpit, and then, if the edifice be somewhat like a fish-market, with a hot-water pipe at their feet, a gas-pipe in the vicinity, and a stove in the rear, they can realise a somewhat Italian atmosphere in cold and cheerless England, and revive some sparks of that devotion that the gloomy vaulting of Westminster and the odious pillars of a new rood screen had well nigh deprived them of."

And our author charitably points out, that they might have caused some serious mischief to Catholic restoration; "but the *cloven foot* is now so visible, that men are looking out in expectation of the *tail*, and are already on their guard." We wish others were.

The whole of Mr. Pugin's argument rests on the bodily presence of our Lord in the sacramental bread. Unless this belief be entertained, the whole falls to the ground. The introduction of screens as separations and means of mystification in the churches for the reformed religion, none the less *Catholic* because termed *Protestant*, would tend to the restoration of a whole train of errors calculated to keep the mind in bondage and debase the world.

COMPETITION SURVEY OF BRADFORD.—The council of this borough, acting as the local Board of Health, on the 17th instant accepted the tender of Mr. James Waddell, surveyor, Manchester, for the survey and plans of the borough, the amount being 860*l*. The council received thirty-one tenders, varying from 400*l*. to 3,750*l*.—a *nice question* of profit and loss.

DISCHARGE OF WATER THROUGH PIPES.—The following is a simple practical rule for finding the quantities of water discharged by pipes of different diameter, and under different heads of water deduced from the rules of M. Bossut and others. Multiply the area of the pipe by the square root of the head of water, and that product by 1117·25 for the theoretical quantity, ⅔ of which will be equal to the actual quantity discharged in imperial gallons per hour.—H.

HOW BIRMINGHAM TREATED ITS VISITORS.

ALL things seem to favour the Great Exhibition: it unquestionably has luck on its side as well as good management, and even the various entertainments which have been given in connection with it have been a series of successes unqualified even by the weather. This was especially the case with the Birmingham *fête* last week: it was an unmitigated success: not a single thing occurred during the whole affair to lessen the pleasure of those engaged in it, notwithstanding that, so far as the London visitors were concerned, it began about seven o'clock in the morning of the 19th and lasted till one in the morning of the 20th. It was no mean achievement to take 300 persons 112 miles, show them all that was to be seen in that wonderful hive of industry, where the busy bees elaborate usefulness and beauty out of rough metals instead of honey out of flowers; to give them breakfast, dinner, and a *soirée*; a little music, and a good deal of speaking, and then to bring them over another 112 miles to their homes again without a disaster or cause for a grumble. Right liberally and well did the people of Birmingham will it, and ably were their views carried out by their worthy mayor, Mr. Lucy. If Shakspeare had been there, who said of the mayor's progenitor, Sir Thomas,—

"Though lucies a dozen he paints in his coat,
His name it shall Lowsie for Lucy be wrote,"

he would have withdrawn his denunciation for the sake of the descendant.

We will not speak of the bustle and breakfast at the station when the train arrived at its destination, or stop to expostulate with the North-Western Railway for want of liberality in their arrangements with the town for the transport, because in the latter case we can scarcely suppose that the directors, when they have been able to think over the unmixed advantage which the Exhibition has been and will be to their company, will refuse to co-operate in the kindly expression on the part of Birmingham. Let us say a word or two of some of the manufactories which were opened to view on the occasion, and to which the visitors, polyglot and pell-mell, rushed off in detachments, each provided with a lucid sketch of the manipulatory processes they might see, written by an intelligent superintendent of one of the principal establishments. Of course there was not time for the same person to see all the manufactories, so each visitor selected the two or three that most interested him. Some went to see the glass-blowing, cutting, and engraving, at the establishments of Messrs. Bacchus, Mr. Harris, or Messrs. Osler; some to the papier-maché works of Messrs. Jennens and Bettridge,* while others went to the workshops of Fox and Henderson. At the glass works some saw for the first time the operation of *pressing* glass, now much practised, and for which the moulds are formed of cast-iron, and are hinged, in order that the article made may be removed with greater facility. The operation is this:—A screw press, with solid plunger, corresponding to the interior of the object to be produced, is fitted to the screw. The servitor collects at the end of his rod sufficient glass; he approaches the mould, and drops it therein; the plunger is screwed down, then reversed, and a complete copy of the interior of the mould is the result. This is, however, covered over with a number of minute cracks: these are removed by heating it again, and causing it to rotate, during which a piece of wood traverses the surface, and fuses the whole into an uniform surface of much brilliancy.

At Messrs. Elkington's, the process of electro-metallurgy was explained and demonstrated: by passing a current of electric or magnetic fluid through a solution formed, say, by dissolving an oxide of silver in cyanide of potassium, the metal held in solution is thrown down upon objects suspended in it, which thus become coated with silver. Gold is thrown down with greater rapidity than silver, and if it be desired to gild only partially, portions of the object suspended are covered with a varnish, which prevents adhesion. Thus it is that the investigations and discoveries of the man of science in his closet are brought to bear on the social progress of the masses. The world has often said, "What's the good?" to abstruse mathematical inquiries and minute physical investigations without immediately obvious results, which have ultimately enriched the country, and increased the comfort of all. The thoughtful recluse, abstracted and, it may be, a "bore," developes a principle, and is scarcely thanked; and the bustling *practical* men of the world apply it, are duly thanked, and, very deservedly, make fortunes.

At Mr. Winfield's establishment for rolled works and brass founding, an incident occurred that gave much pleasure to those who witnessed it. The men engaged there asked leave to present an address to Lord Granville and Mr. Cubitt, who represented the Royal Commission on the occasion: having obtained it, in they came from their work to a new school-room, built by the proprietor for the instruction of the children employed in the works (a large and fitting apartment), and a detachment ascended to the gallery and sang harmoniously and well our loyalty-giving anthem, and some other compositions. They came without changing their dress, and the leader of the choir wielded his baton, like one who felt he was master *there*, without turning down his shirt-sleeves.

The address was exceedingly well written, and was read by a clerk of twenty-five years' standing with an earnestness and gravity that showed plainly the matter was not to be treated lightly. They said in it to the commissioners —"Our intention in the present instance is to congratulate you in connection with the executive committee upon the success of your labours, to convey to you our admiration of the manner in which you have fought the good fight, overcome indifference, put an end to doubt, and manfully subdued opposition. In tendering this our humble tribute of the estimation in which we hold your efforts, we do so with respect; we know your exertions have been lauded by those with whom we may not for one moment compare ourselves. The Exhibition of 1851 is, however, but one great history of industry, written by labour, in metals, on stone, on clay, on silk, and on cotton, bound up in iron, glass, and timber, and as supplying a page in the volume, we are emboldened to approach you, for in that assemblage of all that is useful, rich, and rare, it is proved that indeed 'all is the gift of industry —rich power.' For the first time the varied skill, talent, and industry of England and Englishmen have been rendered apparent to themselves and to the world; labour has been elevated by collecting together its results; the whole is replete with instruction to this and all succeeding generations; it presents and will present a spectacle unsurpassed in moral grandeur in the history of the universe."

Lord Granville responded to it as it deserved, and took occasion to compliment Mr. Winfield on the mutual good feeling which existed between the employer and the em-

* "Papier maché," says the writer of the sketch we have named, "is formed out of a paper of a peculiar kind, which is made to adhere together by a paste composed of glue and other ingredients; the shape of the mould or centre on which it is formed determines the general contour of the tray, caddie, table-top, workbox, or inkstand to be produced. Between the several additional sheets, as they are applied, repeated dryings take place, which in the end results in the production of a light, strong, and unyielding substance, which may be cut with the chisel, filed, or rasped, turned in a lathe, or fitted in the ordinary manner in which timber objects of the same class are: an ordinary tar varnish is applied in repeated coatings, and a storing between each; when sufficiently coated, the irregularities are removed with pumice-stone, and the artist introduces his design, if in colour: if pearl is introduced, scales of the required size and form are attached by means of an adhesive substance, and the inequalities filled up with a varnish; when dried, the whole is reduced to a plane by friction with pumice. If ornaments or flowers have to be introduced, they are now done in the ordinary manner with the brush; the whole surface is covered over with a transparent varnish, which, when dry, is polished up with rotten-stone, and the brilliantly-reflective surface produced by rubbing with the palm of the hand. Of the various improvements, that of the introduction of pearl behind glass in connection with papier maché, as also that of imitation gems in the same position, are among the most recent: in the former case, the design is painted on the reverse side of the glass; certain portions with opaque, others with transparent or varnish colour; behind the latter are introduced the lamina of pearl-shell, which shines through by means of its reflective properties, and under certain circumstances it appears well fitted for particular purposes and situations."

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